

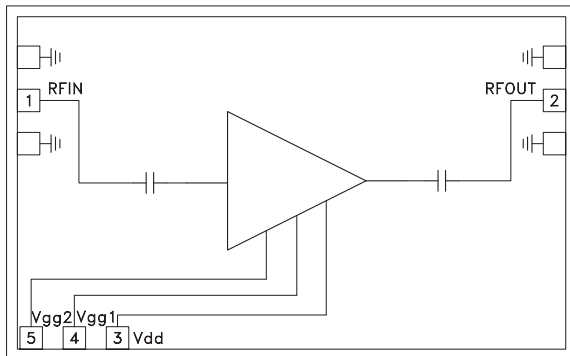
## GaAs HEMT MMIC LOW NOISE AMPLIFIER, 1 - 12 GHz

### Typical Applications

This HMC-ALH444 is ideal for:

- Wideband Communication Systems
- Surveillance Systems
- Point-to-Point Radios
- Point-to-Multi-Point Radios
- Military & Space
- Test Instrumentation
- \* VSAT

### Functional Diagram



### Features

- Noise Figure: 1.75 dB @ 10 GHz
- Gain: 17 dB
- P1dB Output Power: +19 dBm @ 5 GHz
- Supply Voltage: +5V @ 55 mA
- Die Size: 2.64 x 1.64 x 0.1 mm

### General Description

The HMC-ALH444 is a GaAs MMIC HEMT Low Noise Wideband Amplifier die which operates between 1 and 12 GHz. The amplifier provides 17 dB of gain, 1.5 dB noise figure and +19 dBm of output power at 1 dB gain compression while requiring only 55 mA from a +5V supply voltage.

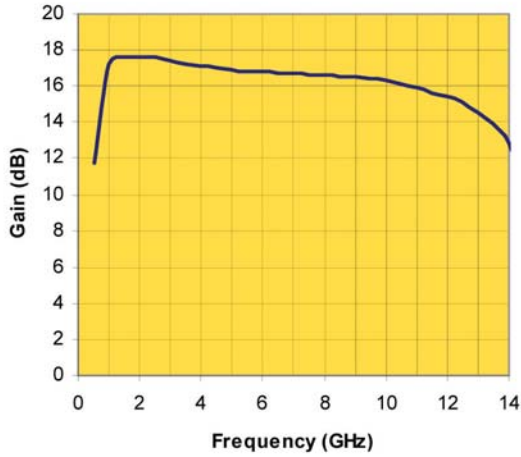
### Electrical Specifications\*, $T_A = +25^\circ\text{C}$ , $V_{dd} = +5\text{V}$

Parameter	Min.	Typ.	Max.	Units
Frequency Range	1 - 12			GHz
Gain	15	17		dB
Gain Variation over Temperature		0.02		dB / °C
Noise Figure		1.5	2	dB
Input Return Loss		10		dB
Output Return Loss		14		dB
Output IP3		28		dBm
Output Power for 1 dB Compression		19		dBm
Supply Current ( $I_{dd}$ ) ( $V_{dd} = 5\text{V}$ , $V_{gg1} = -0.5\text{V Typ.}$ , $V_{gg2} = 1.5\text{V Typ.}$ )		55		mA

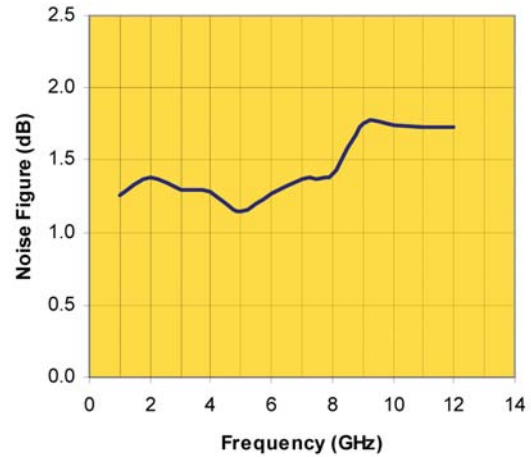
\*Unless otherwise indicated, all measurements are from probed die

**GaAs HEMT MMIC LOW NOISE  
AMPLIFIER, 1 - 12 GHz**

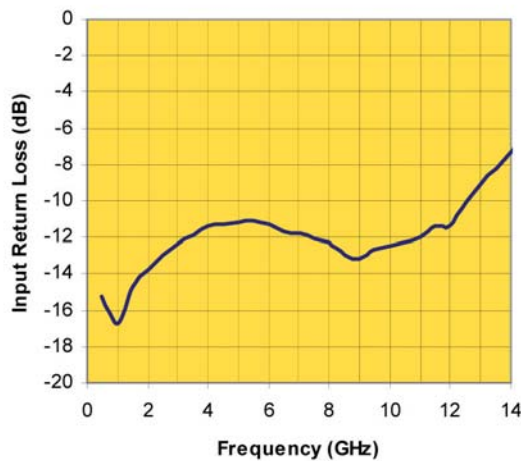
**Linear Gain vs. Frequency**



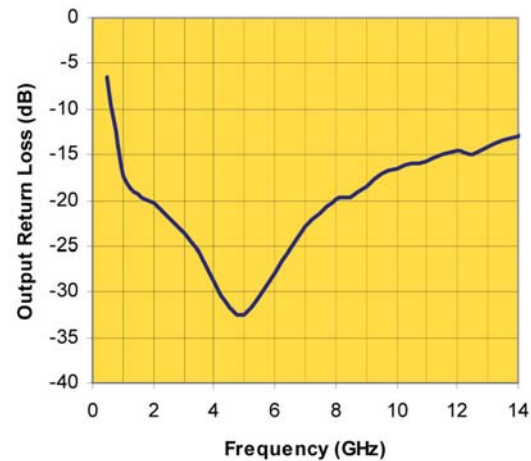
**Noise Figure vs. Frequency**



**Input Return Loss vs. Frequency**



**Output Return Loss vs. Frequency**



Note: Measured Performance Characteristics (Typical Performance at 25°C) Vd= 5 V, Vg2= 1.5 V, Id= 55 mA

## GaAs HEMT MMIC LOW NOISE AMPLIFIER, 1 - 12 GHz

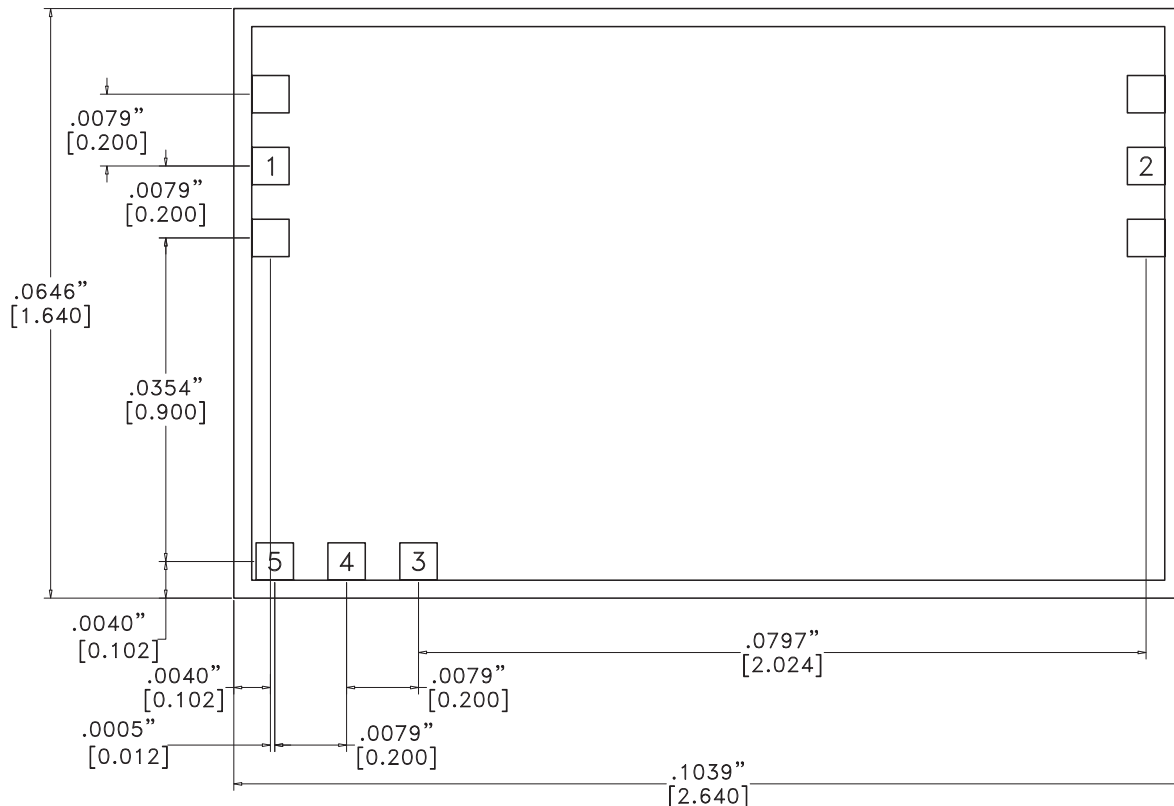
### Absolute Maximum Ratings

Drain Bias Voltage	+5.5 Vdc
RF Input Power	12 dBm
Gate Bias Voltage Vgg1	-1 to 0.3 Vdc
Gate Bias Voltage Vgg2	0 to 2.5 Vdc
Channel Temperature	180 °C
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

### Outline Drawing



**NOTES:**

1. ALL DIMENSIONS ARE IN INCHES [MM].
2. TYPICAL BOND PAD IS .004" SQUARE.
3. BACKSIDE METALLIZATION: GOLD.
4. BACKSIDE METAL IS GROUND.
5. BOND PAD METALLIZATION: GOLD.
6. CONNECTION NOT REQUIRED FOR UNLABELED BOND PADS.
7. OVERALL DIE SIZE  $\pm .002$ "